

# A Microfabricated System for Image Guided Interventions

Friederich Prinz, Ph.D.

Byong-Ho Park, Ph.D.

David Liang, M.D., Ph.D.

Bernard Roth, Ph.D.

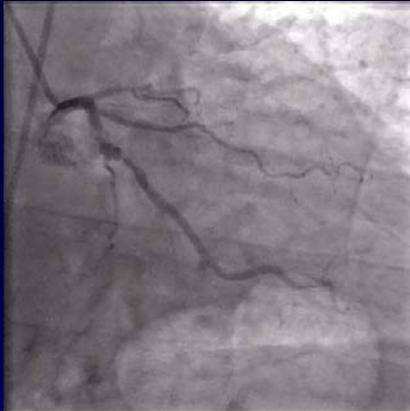
*Stanford University*

*Supported by EB002826*



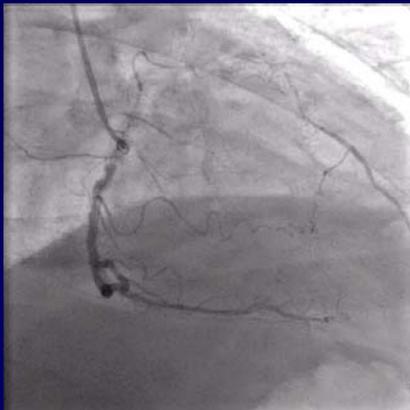
# Chronic Total Occlusion(CTO)

## Left coronary



- 35-43% of patients with multivessel disease a CTO
- Success rate for PCI in CTO is ~ 57% of *selected* cases
  - Failure to introduce guidewire across lesion
    - Inability to visualize occluded vessel
    - Inability to steer precisely

## Right Coronary



# Guided Intervention of CTO's



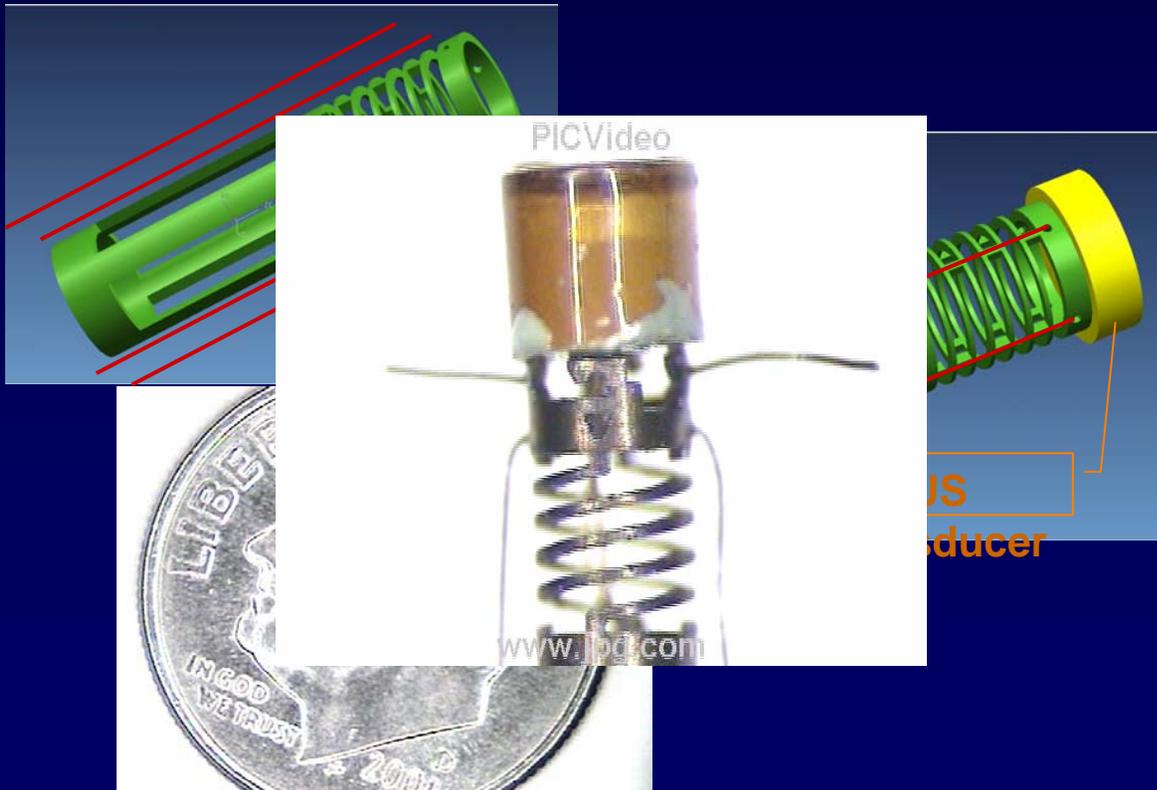
- 
- 
- 

nd

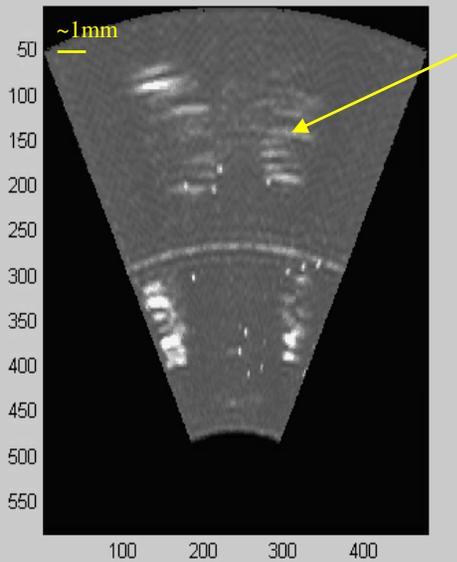


# Design Concept

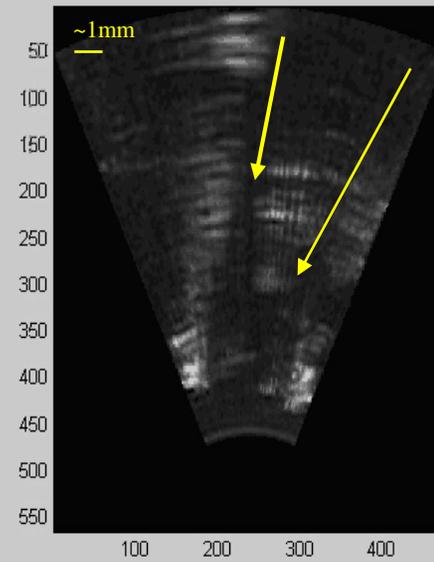
- In situ activation with SMA actuators
- Microfabricated compliant mechanisms



# In Vitro Imaging of Pig Artery



Stenosis



Branch



# Imaging-Steering Device Prototype

- Ultrasound imaging device combined with steering mechanism



# Current Focus

- Image Enhancement
  - Improved transducer scanning
  - Improved transducers
    - Annular arrays – Capacitive micromachined transducers
- Improved motion control
  - Hysteresis
  - Feedback control
- Interventional device integration
- More complex devices
  - Control systems
  - Integrated electronics and sensors

